



**MARYLAND
PORT
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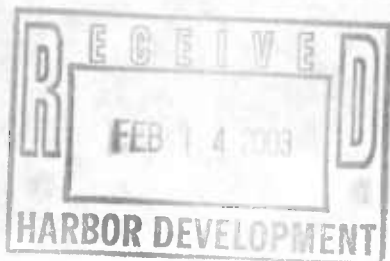
**Poplar Island
Environmental Restoration Project**

**2003
Crust Management Plan**

MPA Contract Number # 502813
PIN # 51030049

Prepared for:
MARYLAND PORT ADMINISTRATION
2310 Broening Highway
Baltimore, MD 21224
Contract Number: 502813

Prepared by:
MARYLAND ENVIRONMENTAL SERVICE
2011 Commerce Park Drive
Annapolis, MD 21401





MARYLAND
ENVIRONMENTAL
SERVICE

Robert L. Ehrlich, Jr.
Governor

James W. Peck
Director

February 12, 2003

Mr. Frank L. Hamons
Harbor Development
Maryland Port Administration
The Maritime Center II
2310 Broening Highway
Baltimore, MD 21224-6627

RE: 2003 Poplar Island ERP Crust Management Plan

Dear Mr. Hamons:

Enclosed is the 2003 Crust Management Plan for the Poplar Island Environmental Restoration Project.

If you should have any questions or comments regarding this report, please contact me at (410) 974-7261.

Sincerely,

Lincoln Tracy
Project Manager
Environmental Dredging Program

tmr
encl.

cc: Dave Bibb
Wayne Young
Dave Well
Kevin Barry
Thomas M. Reilly

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2003 Poplar Island ERP Crust Management Plan

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2003 Poplar Island ERP Crust Management Plan

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Poplar Island Environmental Restoration Project 2003 Crust Management Plan

I. Introduction

Crust Management plays a critical role in the effective utilization of placement capacity at dredged material placement sites. The steps presented in this plan reflect the lessons learned from crust management activities not only from Poplar Island's first crust management season (January 30, 2002 – November 13, 2002), but also from the numerous seasons at Hart-Miller Island DMCF.

The Poplar Island Environmental Restoration Project (ERP) is subdivided into seven containment cells. Phase I of Poplar Island includes the northern-most cells: cell 1, cell 2, cell 3D and cell 3. Phase II encompasses the southern-most 3 cells: cell 4, cell 5 and cell 6. Cells 1, 3D, 4, and 5 are classified as wetland cells while cell 2 and cell 6 are classified as upland cells. To date, only cells 1, 2, 3, and 3D have received dredged material inflow. It is not yet necessary to perform crust management in cells 1 and 3. Therefore, this plan will focus on crust management activities in cell 2 and cell 3D. The 2003 crust management season will begin in mid-February 2003 and is estimated to continue through September 2003, a span of eight months.

II. Crust Management Operations

The 2003 Crust Management Plan consists of three phases. During the initial phase, the site will be aggressively dewatered (release of pond) by means of establishment of spillway sumps, shallow pontoon depressions and perimeter trenches. Once the surface material has dried and a crust has begun to form, phase II will be implemented and the interior trenching effort will begin throughout all accessible areas of the cells. To properly prepare for the next inflow season, phase III will provide a transition period that will provide a smooth conversion from crust management to inflow. Phase III activities include filling in the perimeter trench and sumps and preparing the inflow points for next season's inflow.

Phase I – Cell 2

Phase I will begin immediately following the completion of dredged material inflow, which is anticipated for mid-February 2003. During this phase, cell 2 will be aggressively worked using all appropriate equipment and available personnel to drain water. The following tasks will be performed during phase I.

A. Excavation of Spillway Sumps

1. The settlement pond in cell 2 will be completely drained.
2. Sumps shall be created at spillways #1 and #3 to promote drainage and to allow solids to settle out from discharge waters.
3. A pontoon excavator and long- and short-reach excavators will be utilized to perform these tasks.

B. Perimeter Trench

1. A perimeter trench will be excavated around the interior border of cell 2 using the long- and short-reach excavators. The perimeter trench is the primary drainage path to each of the spillways. At the onset of crust management, the material will only be able to support a trough, but as the material dries and strengthens, deeper trenching can be performed. The trench will eventually migrate inward, away from the dike as additional passes with excavators continue.
2. Material excavated from the perimeter trench is placed on the interior slope of the dike. An excavator will scarify this material. A dozer will be utilized to push the material to the bench where it will be compacted in order to strengthen and raise the bench.

3. MES operators will track the amount of trench excavated in linear feet through the use of station numbers.

C. Interior Trenching

1. Interior trenches serve the purpose of accelerating drainage to the perimeter trench and ultimately to spillway 1. The interior trenching effort during this phase may be limited due to infirm material conditions in the cell. The upper three to four feet of sediment needs to be able to support such a trench before interior trenching is attempted. The areas most likely to be able to support interior trenches during phase I may be closer to the previous years' inflow points where larger-grain sediment is located.
2. The pontoon trencher shall be used to establish the interior trenches during this stage - where feasible (figure II-1).
3. MES operators will track the amount of interior trenches excavated in linear feet.

D. Cell 2 Inflow Points

1. The areas immediately downstream of the inflow points of cell 2 will consist primarily of coarser, heavier dredged sediment. This sediment, being suitable construction-grade material, will be reclaimed and reused around the island for dike maintenance, bench construction and island improvements (figure II-3).
2. MES operators will track the amount of material reclaimed in cubic yards.

E. Pontoon Depressions

Pontoon depressions will not be attempted in cell 2 due to the presence of underdrains.

F. Underdrains and Underdrain Sumps

Water that has accumulated at the five sumps attached to the underdrain system shall be pumped out. The excess water shall be pumped either to cell 1 or to cell 3 - whichever is closest (figure II-4).

Phase I – Cell 3D

Phase I will begin immediately following the completion of dredged material inflow, which is anticipated for mid-February, 2003. During this phase, cell 3D will be aggressively worked using all

appropriate equipment and available personnel to drain water. The following tasks will be performed during phase I.

A. Excavation of Corner Sumps

1. Sumps shall be excavated in 2 corners of cell 3D using the long- and/or short-reach excavator(s) (figure II-5). The sumps will act to promote drainage of the interior of cell 3D.
2. Pumps placed at the corners of cell 3D will dewater the sumps. The northwest sump will be pumped to cell 1, while the southern sump will be pumped to Poplar Harbor. The outfall of the southeast pump will be located within 100' of spillway 5.

B. Perimeter Trench

1. A perimeter trench will be dug around the interior border of cell 3D using the long- and short-reach excavators. The perimeter trench is the primary drainage path to each of the sumps. At the onset of crust management, the material will only be able to support a trough, but as the material dries and strengthens, deeper trenching can be performed. The trench will eventually migrate inward, away from the dike as additional passes with excavators continue.
2. Material excavated from the perimeter trench is placed on the interior slope of the dike. An excavator will scarify this material.
3. MES operators will track the amount of trench excavated in linear feet by station number.

C. Interior Depressions

1. The pontoon excavator shall be used to create shallow depressions by walking the interior of cell 3D. This will improve the flow of trapped water and rainwater to the perimeter trench. Most of the crust of cell 3D is comprised of a slurry-like material during the early stages of phase I. The only piece of equipment that can successfully negotiate these conditions while leaving depressions in the crust is the pontoon excavator.
2. Depressions shall initially be established 75 feet on-center and at a 45-degree angle with the perimeter dike (figure II-1)

3. As phase I progresses, the distance between pontoon depressions shall be reduced so as to maximize drainage to the perimeter trench.
4. MES operators will track the amount of depressions in linear feet by station number (figure II-5)

Phase II – Cell 2

The primary focus of phase II is the establishment of a network of interior trenches. Interior trenching not only accelerates rainwater run-off but also acts to de-water the slurry-like sediment. Personnel and equipment shall be utilized to maximize trenching during this phase. Some overlapping of phase I and phase II will occur.

A. Perimeter Trench

1. The perimeter trench shall be widened and deepened with additional passes by the conventional excavator, the long reach excavator, and the pontoon excavator. Areas of soft material are expected to slough into the trench, requiring additional excavation (figure II-1).
2. Material excavated from the perimeter trench shall be placed along the bench and interior slope of the perimeter dike.
3. MES operators will track the amount of trench excavated in linear feet through the use of station numbers.

B. Interior Trenches

1. When a suitable crust develops over the surface of the cell (enough to support the formation of the trench itself and the weight of the trencher), interior trenching shall begin.
2. Interior trenches will accelerate water drainage to the perimeter trench, therefore hastening the drying process.
3. Distance between interior trenches shall initially be 300 feet. Each perimeter trench shall be at an angle of 45-degrees from the perimeter dike (figure II-2).
4. If trenching cannot be performed in certain areas due to infirm sediment, trenches shall be established at shorter intervals in areas that can support trenches.

5. As phase II progresses, interior trenches shall be cut at shorter intervals so as to maximize drainage to the perimeter trench (figure II-2).

6. MES operators will track the amount of trenches excavated in linear feet.

C. Cell 2 Inflow Points

1. The areas immediately downstream of the inflow points of cell 2 will consist primarily of coarser, heavier dredged sediment. This sediment, being suitable construction-grade material, will be reclaimed and reused around the island for various dike and operations-pad improvements (figure II-3).

2. MES operators will track the amount of material reclaimed in cubic yards.

D. Crust Reclamation

1. Once a crust has formed in the interior of cell 2, pontoon excavators will be utilized to reclaim the dried crust material from inside of the perimeter trench. This will accelerate drainage of the interior of cell 2. The reclaimed material should either be stockpiled along the bench and the interior of the dike or be transported to another area of the island for construction use. The sediment stockpiled on the bench and interior slope of the dike will be used to fill in the perimeter trench in phase III (figure II-3).

2. As the material exposed from crust reclamation begins to dry and form a crust, a second pass to reclaim more material may be completed.

3. Crust will be reclaimed directly downstream of the old inflow points. This sediment, being suitable construction-grade material, will be reclaimed and reused around the island for dike maintenance, bench construction and island improvements (figure II-3).

4. MES operators will track the amount of material reclaimed in cubic yards.

E. Underdrains and Underdrain Sumps

Water that has accumulated at the five sumps attached to the underdrain system shall be pumped out. The excess water shall be pumped either to the perimeter trench, to cell 1 or to cell 3 (figure II-4).

Phase II – Cell 3D

The primary focus of phase II is the establishment of a network of interior trenches. Interior trenching not only accelerates rainwater run-off but also acts to de-water the slurry-like sediment. Personnel and equipment shall be utilized to maximize trenching during this phase. Some overlapping of phase I and phase II will occur.

A. Excavation of Corner Sumps

1. The sumps in all four corners of cell 3D shall be periodically deepened in order to keep the pumps functioning. The long- and/or short-reach excavator(s) shall be used to maintain the sumps.
2. The pumps, placed at the corners of cell 3D, will need periodic maintenance.

B. Perimeter Trench

1. The perimeter trench shall be deepened and widened using the long- and short-reach excavators. The trench will eventually migrate inward, away from the dike as additional passes with excavators continue.
2. Material excavated from the perimeter trench is placed on the interior slope of the dike. An excavator will scarify this material.
3. MES operators will track the amount of trench excavated in linear feet by station number.

C. Interior Trenches

1. When a suitable crust develops over the surface of the cell (enough to support the formation of the trench itself and the weight of the trencher), interior trenching shall begin.
2. Interior trenches will accelerate water drainage to the perimeter trench, therefore hastening the drying process.
3. Distance between interior trenches shall initially be 75 feet. Each interior trench shall be at an angle of 45-degrees from the perimeter dike (figure II-2).
4. If trenching cannot be performed in certain areas due to infirm sediment, trenches shall be established at shorter intervals in areas that can support trenches.

5. As phase II progresses, interior trenches shall be cut at shorter intervals so as to maximize drainage to the perimeter trench (figure II-2).
6. MES operators will track the amount of trench excavated in linear feet by station number.

Phase III – Cell 2

In order to take full advantage of the crust management effort, the site will be properly prepared for the subsequent inflow season. By properly preparing the site, the time required to establish sumps and perimeter trenches during phase I of the following crust management season is significantly reduced.

A. Perimeter Trench

1. The perimeter trench will be filled in to an elevation that is even with the surface of the cell. Dried surface crust material from the inside of the cell and dried and compacted material placed on the slope of the dike in phase II will be used to fill in the perimeter trench.
2. The D6R dozers will be used to fill in the perimeter trench.
3. The perimeter bench will be graded and prepared for the ensuing inflow season.

B. Interior Trenches

Interior trenching efforts will continue as long the processes of dewatering and consolidation continue to occur.

C. Sumps at Spillways

Sumps created in phase I at spillways #1 and #3 will be filled in using larger-grained sediment. The long- and short-reach excavators and bulldozers will be utilized to perform these tasks. Larger-grained sediment is easier to excavate and will therefore reduce the time needed to reestablish the sumps in phase I of the next crust management season.

D. Cell 2 Inflow Points

1. The perimeter dike immediately adjacent to the upcoming 2003-2004 inflow points will be adequately graded, strengthened, and widened in preparation for mobilization of the dredging contractor and the inflow pipeline.

2. The new inflow points for the upcoming dredging season should be shaped and built up to accommodate the inflow pipe.

E. Crust Reclamation

1. Crust reclamation around the 2002 inflow points and the perimeter trench will continue as long as time permits.
2. Reclaimed crust material will be used to fill in the perimeter trench as well as for dike and bench construction.
3. MES operators will track the amount of crust reclaimed in cubic yards.

Phase III – Cell 3D

Depending on future elevation and volume measurements, cell 3D may not accept any more dredged material. As a result, phase III may not be incorporated. Assuming this is the case, the perimeter trenches will not be filled, the sumps will not be removed and the interior trenching effort will continue on an as-needed basis in order to meet the desired mean elevation of the cell.

Cell 3

Dewatering

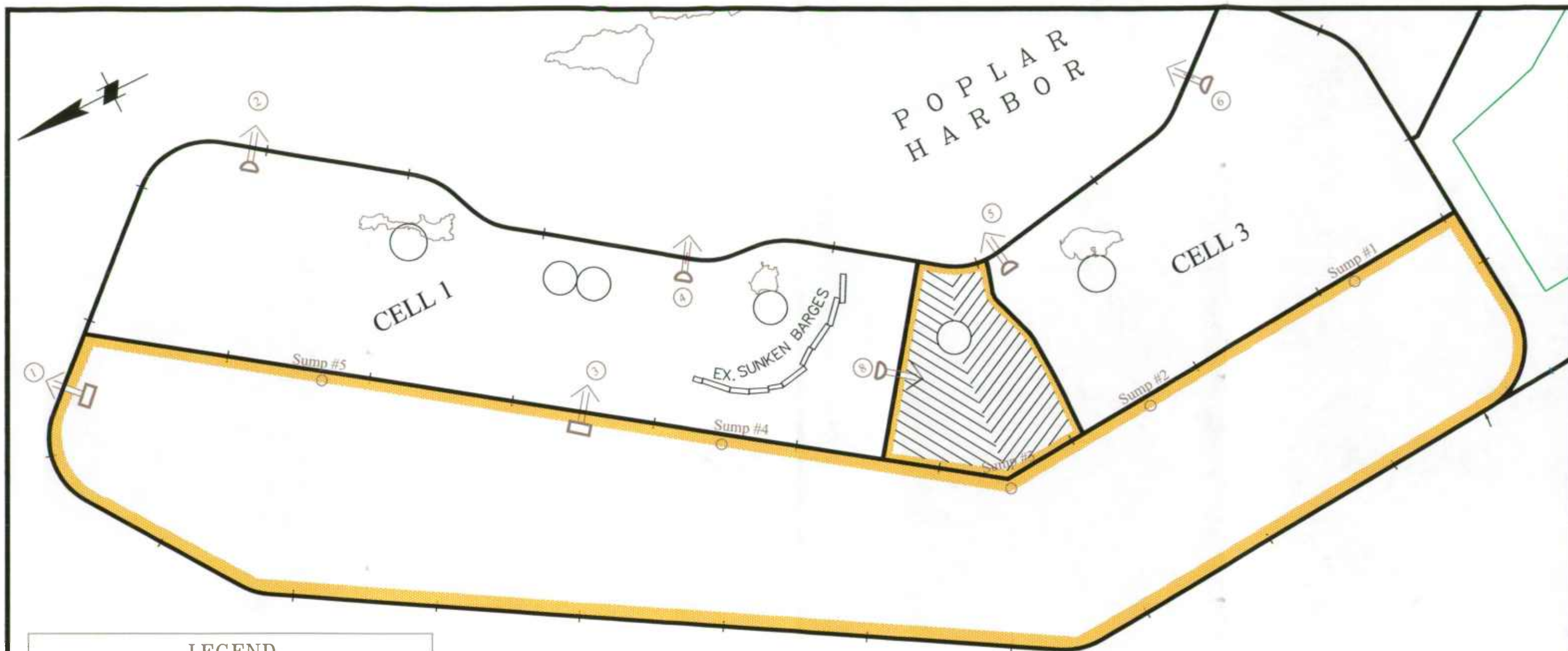
1. The settlement pond in cell 3 will be drained through the use of spillway weir boards.
2. Sumps will be created at spillways #5 and #6 to promote drainage and to allow solids to settle out from discharge waters.
3. A pontoon excavator and long- and short-reach excavators will be utilized to perform these tasks.
4. A pump will be placed and utilized at spillways #5 and #6 when the water level of cell 3 becomes lower than that of Poplar Harbor. The outfall of the pump will be located within 100' of the spillway.

Cell 1

Dewatering

1. The settlement pond in cell 1 will be drained through the use of spillway weir boards.

2. Sumps will be created at spillways #4 and #2 to promote drainage and to allow solids to settle out from discharge waters.
3. A pontoon excavator and long- and short-reach excavators will be utilized to perform these tasks.
4. A pump will be placed and utilized at spillways #2 and #4 when the water level of cell 1 becomes lower than that of Poplar Harbor. The outfall of the pump will be located within 100' of the spillway.



LEGEND

 Perimeter Trench

 Cell 3D Pontoon Depressions
 First Pass

GRAPHIC SCALE



(IN FEET)

1 inch = 700 ft

DRAWN BY: TMR

Date: February 3, 2003

CHECKED BY: TMR

DRAWING NO.: FIGURE II-1

JOB NO.: 792-7305

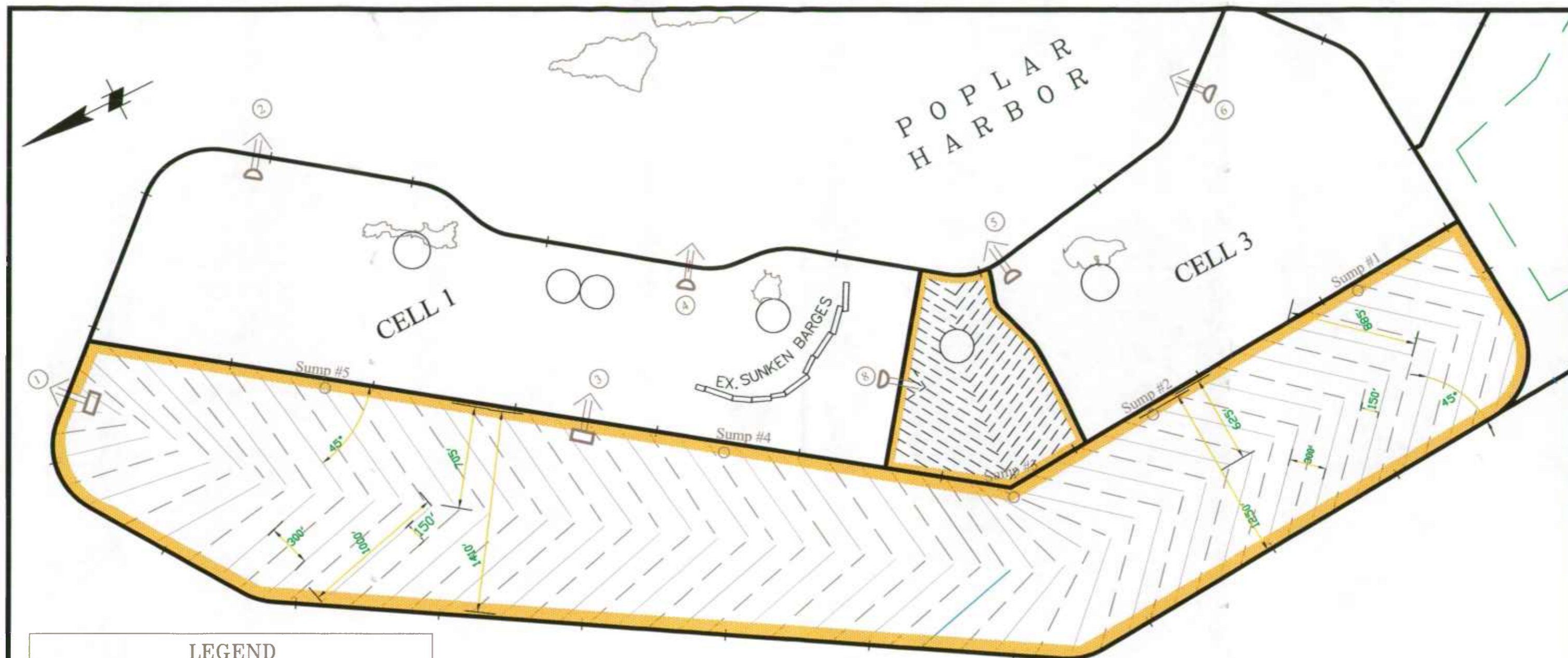
SHEET 1 OF 1



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Figure II-1
 Pontoon Depression Plan - Cell 3D

*Poplar Island ERP
 Crust Management Plan*



LEGEND

 Perimeter Trench

Cell 2 Interior Trenches

— First Pass

— Second Pass

Cell 3D Interior Trenches

--- First Pass

GRAPHIC SCALE



(IN FEET)

1 inch = 700 ft

DRAWN BY: TMR

Date: February 3, 2003

CHECKED BY: TMR

DRAWING NO.: FIGURE II-2

JOB NO.: 792-7305

SHEET 1 OF 1

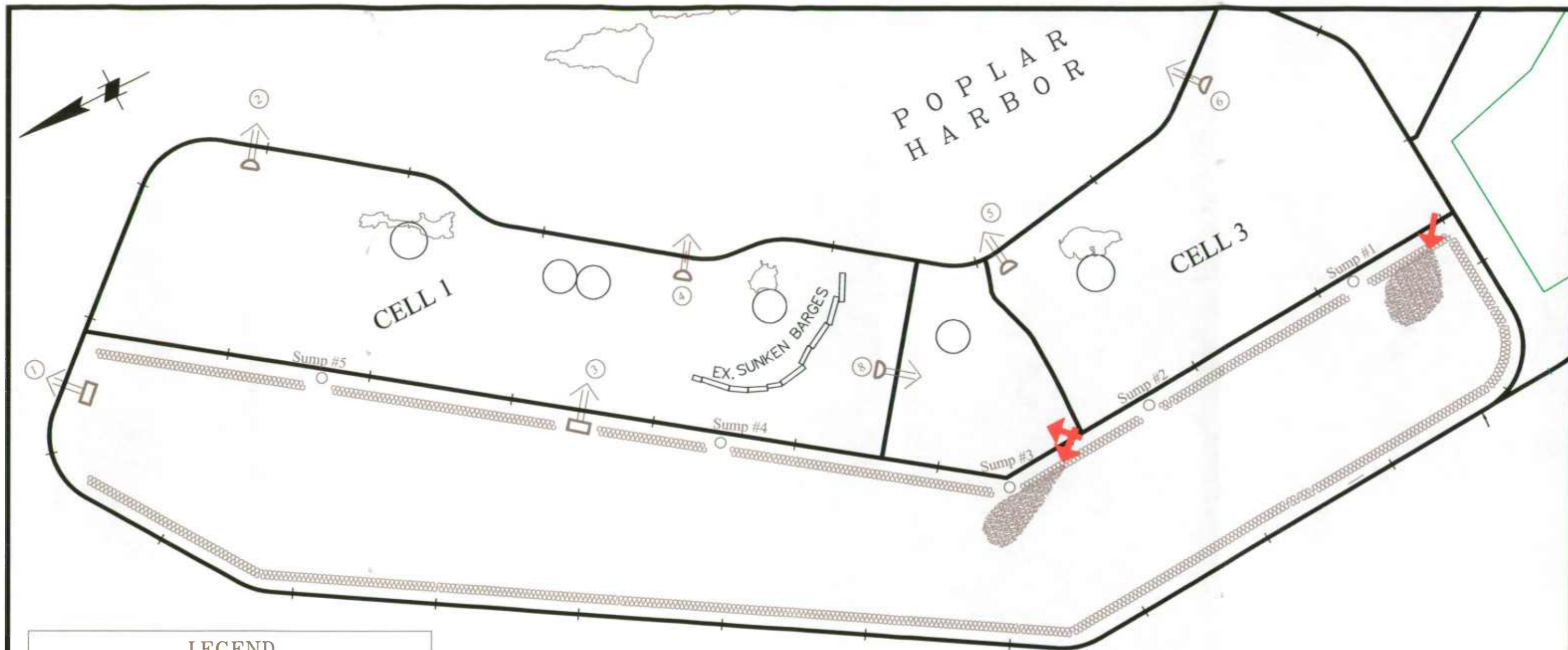


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Figure II-2

Interior Trenching Plan - Cell 2 and 3D

*Poplar Island ERP
Crust Management Plan*



LEGEND

 Crust Scraping Area
 Crust Reclamation Area

 Inflow Points

GRAPHIC SCALE



(IN FEET)

1 inch = 700 ft

DRAWN BY: TMR

Date: February 3, 2003

CHECKED BY: TMR

DRAWING NO.: FIGURE II-3

JOB NO.: 792-7305

SHEET 1 OF 1

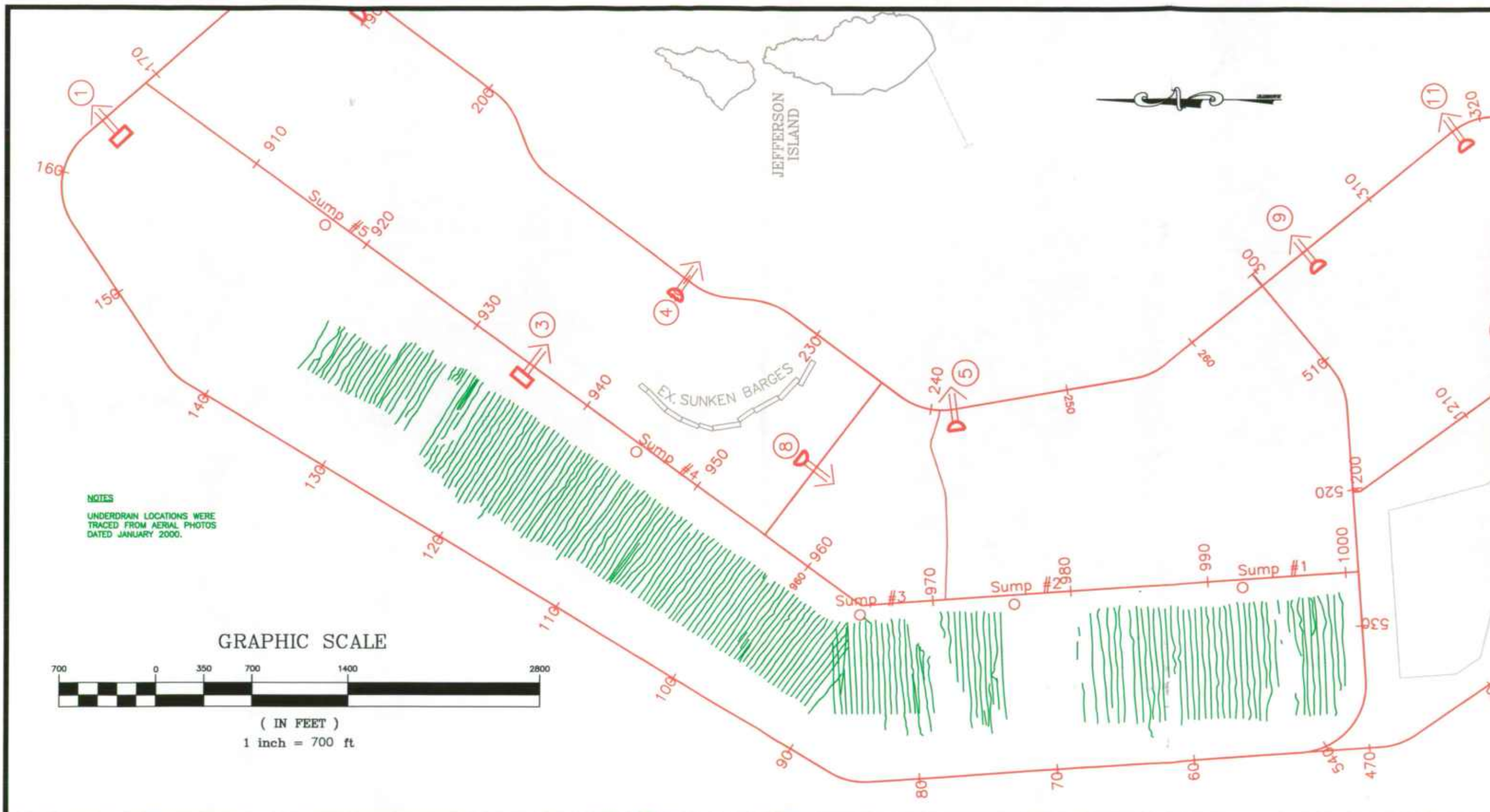


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Figure II-3

Crust Reclamation and Scraping Plan - Cell 2

*Poplar Island ERP
Crust Management Plan*



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DATE: February 3, 2003

CHECKED BY: TMR

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JOB NO.:

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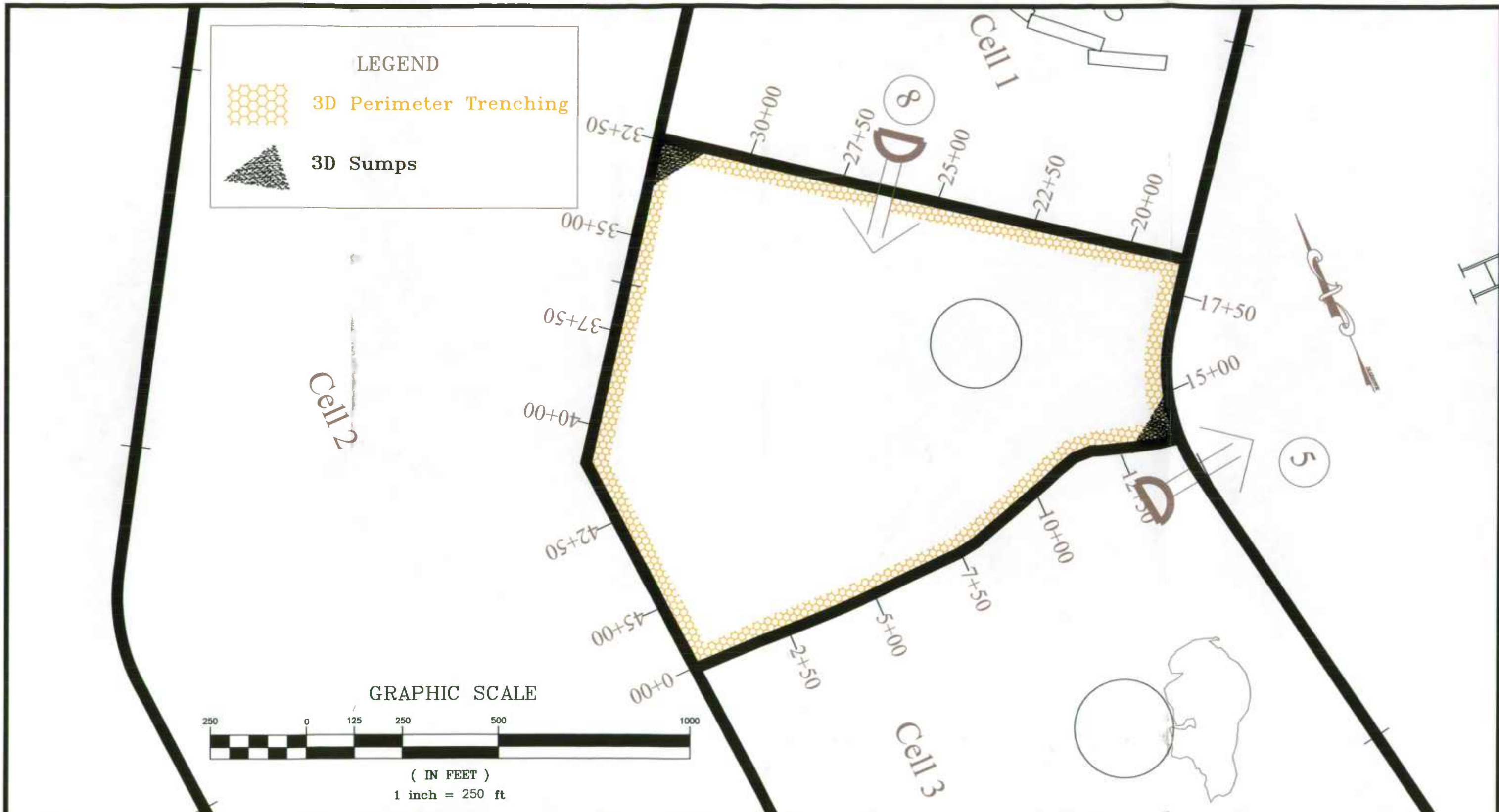


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Figure II-4

Cell 2 Underdrain and Sump Locations

Poplar Island ERP
Crust Management Plan



DRAWN BY: TMR	Date: February 3, 2003
CHECKED BY: TMR	DRAWING NO.: FIGURE II-5
JOB NO.: 792-7305	SHEET 1 OF 1



Figure II-5
 Cell 3D Sump and Station Locations

*Poplar Island ERP
 Crust Management Plan*

III. Deliverables

A review of the crust management activities will be submitted to the Maryland Port Administration (MPA) within 90 days of the cessation of crust management activities. The crust management review will contain an overview of the previous inflow season operations, an outline of crust management activities and an overview of elevation monitoring.

IV. Budget

The 2003 crust management season is estimated to begin as soon as Weeks Marine, Inc. finishes depositing dredged material at Poplar Island. It is estimated that Weeks Marine, Inc. will finish their unloading operations in early February 2003. Crust management operations will begin as soon as Weeks demobilizes. The 2003 crust management season will continue until the next the next inflow season begins. It is estimated that the 2003 crust management season will last around 8 months and will cost approximately \$1,083,447.67 (see tables IV-1, IV-2, IV-3, IV-4 and IV-5).

Table IV-1
Production Estimates

Cell 2

<i>Function</i>	<i>Average Production Rate (lf/hr; cy/hr)</i>	<i>Linear Feet/Pass</i>	<i>Hours/Pass</i>	<i>Estimated Passes</i>	<i>Total Hours</i>	<i>Equipment **</i>
Perimeter Trenching (lf)	100	24,000	240	3	720	lre, sre, dozer
Pontoon Depressions (lf)	n/a	n/a	n/a	n/a	n/a	pe
Interior Trenching (lf)	130	42,000	323	2	646	pt
Crust Reclamation (cy) *	224	n/a	n/a	n/a	10	dozer, lre, sre, adt, loader

Cell 3D

<i>Function</i>	<i>Average Production Rate (lf/hr; cy/hr)</i>	<i>Linear Feet/Pass</i>	<i>Hours/Pass</i>	<i>Estimated Passes</i>	<i>Total Hours</i>	<i>Equipment **</i>
Perimeter Trenching (lf)	100	14,000	140	2	280	lre, sre, dozer
Pontoon Depressions (lf)	1,000	19,000	19	2	38	pe
Interior Trenching (lf)	130	19,000	146	2	292	pt
Crust Reclamation (cy) *	224	n/a	n/a	n/a	0	n/a

* Production Rate assumes the use of two 16-cy capacity adts, 0.5-mile haul distance, 2-cy capacity excavator bucket

** lre = long-reach excavator; sre = short-reach excavator; dozer = bulldozer; pe = pontoon excavator; pt = pontoon trencher; adt = articulated dump truck

Table IV-2
FY 2003 Salary Estimate

Salaries

Employee	Title	Grade	FY '03 Rate	Hours*	Subtotal
COSTNER, TERRY	FIELD OPS SUP I	13	\$17.49	600	\$10,494.00
THUME, MIKE	HVY EQUIP OPR II	11	\$14.19	600	\$8,514.00
KRAEGENBRINK, HAROLD	HVY EQUIP OPR III	12	\$15.44	600	\$9,264.00
ALLEN, LEON	HVY EQUIP OPR II	11	\$14.42	600	\$8,652.00
BALL, KEVIN	HVY EQUIP OPR II	11	\$14.54	600	\$8,724.00
JONES, JAY	HVY EQUIP OPR II	11	\$14.54	600	\$8,724.00
MISTER, SCOTT	HVY EQUIP OPR III	12	\$15.44	600	\$9,264.00
NEWPERT, WILLIAM	HVY EQUIP OPR II	11	\$14.19	600	\$8,514.00
				4,800	\$72,150.00

Overtime

Employee	Title	Grade	FY '03 Rate	Hours	Subtotal
COSTNER, TERRY	FIELD OPS SUP I	13	\$17.49	300	\$7,870.50
THUME, MIKE	HVY EQUIP OPR II	11	\$14.19	300	\$6,385.50
KRAEGENBRINK, HAROLD	HVY EQUIP OPR III	12	\$15.44	300	\$6,948.00
ALLEN, LEON	HVY EQUIP OPR II	11	\$14.42	300	\$6,489.00
BALL, KEVIN	HVY EQUIP OPR II	11	\$14.54	300	\$6,543.00
JONES, JAY	HVY EQUIP OPR II	11	\$14.54	300	\$6,543.00
MISTER, SCOTT	HVY EQUIP OPR III	12	\$15.44	300	\$6,948.00
NEWPERT, WILLIAM	HVY EQUIP OPR II	11	\$14.19	300	\$6,385.50
				2,400	\$54,112.50

1201	\$54,112.50	base	5125	\$36,076.80
		premium	5126	\$18,035.70

Total Hours: 7200

Sub-total

Salaries: \$125,050.86

Fringe: \$63,326.60

Overhead: \$56,272.89

Total Salaries: \$244,596.64

* The 2003 Crust Management Season is estimated to span 8 months (February –October 2003). Hour totals for FY 2003 reflect that 5 months of the 2003 Crust Management Season fall in FY 2003 and 3 months fall in FY 2004.

Table IV-3
FY 2004 Salary Estimate

Salaries

Employee	Title	Grade	FY '04 Rate	Hours	Subtotal
COSTNER, TERRY	FIELD OPS SUP I	13	\$18.01	360	\$6,485.29
THUME, MIKE	HVY EQUIP OPR II	11	\$14.62	360	\$5,261.65
KRAEGENBRINK, HAROLD	HVY EQUIP OPR III	12	\$15.90	360	\$5,725.15
ALLEN, LEON	HVY EQUIP OPR II	11	\$14.85	360	\$5,346.94
BALL, KEVIN	HVY EQUIP OPR II	11	\$14.98	360	\$5,391.43
JONES, JAY	HVY EQUIP OPR II	11	\$14.98	360	\$5,391.43
MISTER, SCOTT	HVY EQUIP OPR III	12	\$15.90	360	\$5,725.15
NEWPERT, WILLIAM	HVY EQUIP OPR II	11	\$14.62	360	\$5,261.65
				2,880	\$44,588.70

Overtime

Employee	Title	Grade	FY '04 Rate	Hours	Subtotal
COSTNER, TERRY	FIELD OPS SUP I	13	\$18.01	180	\$4,863.97
THUME, MIKE	HVY EQUIP OPR II	11	\$14.62	180	\$3,946.24
KRAEGENBRINK, HAROLD	HVY EQUIP OPR III	12	\$15.90	180	\$4,293.86
ALLEN, LEON	HVY EQUIP OPR II	11	\$14.85	180	\$4,010.20
BALL, KEVIN	HVY EQUIP OPR II	11	\$14.98	180	\$4,043.57
JONES, JAY	HVY EQUIP OPR II	11	\$14.98	180	\$4,043.57
MISTER, SCOTT	HVY EQUIP OPR III	12	\$15.90	180	\$4,293.86
NEWPERT, WILLIAM	HVY EQUIP OPR II	11	\$14.62	180	\$3,946.24
				1,440	\$33,441.53

1201	33,442	base	5125	22,295
		premium	5126	11,146

Total Hours: 4,320

Sub-total

Salaries:: \$78,030.23

Fringe: \$40,762.99

Overhead: \$35,113.60

Total Salaries: \$153,906.82

* The 2003 Crust Management Season is estimated to span 8 months (February -October 2003). Hour totals for FY 2003 reflect that 5 months of the 2003 Crust Management Season fall in FY 2003 and 3 months fall in FY 2004.

Figure IV-4
Equipment Rates Estimate

Equipment	Hours		USACE Rates		Charges		asset type	Rental Rate	Total
	Crust Mgt	Stand-by	Use	Stand-by	Crust Mgt	Stand-by			
CAT D6R Dozer #1	510	1410	\$99.60	\$24.98	\$50,796.00	\$35,221.80	Fixed		\$86,017.80
CAT D6R Dozer #2	510	1410	\$99.60	\$24.98	\$50,796.00	\$35,221.80	Fixed		\$86,017.80
CAT D2500 Dump #1	20	1900	\$70.24	\$19.73	\$1,404.80	\$37,487.00	Fixed		\$38,891.80
CAT D2500 Dump #2	20	1900	\$70.24	\$19.73	\$1,404.80	\$37,787.00	Fixed		\$38,891.80
Pontoon Excavator	75	1845	\$122.12	\$39.18	\$9,159.00	\$72,287.10	Fixed		\$81,446.10
CAT 325 Long Reach Exc #1	505	1415	\$81.55	\$24.86	\$41,182.75	\$35,176.90	Fixed		\$76,359.65
CAT 325 Short Reach Exc #1	505	1415	\$36.88	\$10.12	\$18,624.40	\$14,319.80	Fixed		\$32,944.20
CAT 950G Loader	20	1900	\$51.48	\$12.23	\$1,029.60	\$23,237.00	Fixed		\$24,266.60
Godwin 3" Pump #1	2040	0	\$4.42	\$1.10	\$9,016.80	\$0.00	Fixed		\$9,016.80
Godwin 3" Pump #2	2040	0	\$4.42	\$1.10	\$9,016.80	\$0.00	Fixed		\$9,016.80
Godwin 3" Pump #1	8 months	n/a	\$4.42	\$1.10	n/a	n/a	Rental	\$675.00	\$5,400.00
Godwin 3" Pump #2	8 months	n/a	\$4.42	\$1.10	n/a	n/a	Rental	\$675.00	\$5,400.00
Sump Pump # 1	2040	0	\$0.94	\$0.25	\$1,917.60	\$0.00	Fixed		\$1,917.60
Sump Pump # 3	2040	0	\$0.94	\$0.25	\$1,917.60	\$0.00	Fixed		\$1,917.60
Sump Pump # 5	2040	0	\$0.94	\$0.25	\$1,917.60	\$0.00	Fixed		\$1,917.60
Honda 4" Pump	2040	0	\$3.70	\$0.27	\$7,548.00	\$0.00	Fixed		\$7,548.00
Ford F250 Crew Cab #1	768	1152	\$23.20	\$5.09	\$17,817.60	\$5,863.68	Fixed		\$23,681.28
Ford F250 Crew Cab #2	768	1152	\$23.20	\$5.09	\$17,817.60	\$5,863.68	Fixed		\$23,681.28
Aluminum Pontoon Trencher	950	970	\$96.44	\$24.30	\$91,618.00	\$23,571.00	Fixed		\$115,189.00
Barge Runs	n/a	n/a	n/a	n/a	n/a	n/a	Rental	\$5,177.50	\$15,532.50

Total Equipment Usage Based on USACE Hourly Rates: \$332,984.95 \$325,736.76 \$685,054.21

- Notes:**
1. Items marked "Rental include the actual monthly rental charges.
 2. Rental equipment used for a partial month is charged by the hour.
 3. USACE equipment rates include fuel and maintenance costs, but do not include the operator charge.
 4. Stand-by time is based on 5 (8-hour days) per week or 240 hours per month.
 5. All pumps run 24 hours and are not charged stand-by time
 6. Three barge Runs were budgeted for the 2003 Crust Management Season.

Figure IV-5
2003 Crust Management Season Budget Totals

	<i>FY 2003</i>	<i>FY 2004</i>	<i>Totals</i>
Salaries	\$244,596.64	\$153,906.82	\$398,503.46
Equipment Costs	N/A	N/A	\$685,054.21
Total:			\$1,083,447.67